

1 **CLAIMS**

2 What is claimed is:

3 1. A method comprising;
4 compressing video objects;
5 generating at least one corresponding elementary stream comprising
6 the compressed video objects;
7 classifying information within each elementary stream based on
8 importance; and
9 assembling the classified information into packets associated with
10 different classes of network packets.

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12 2. The method as recited in Claim 1, wherein classifying the
13 information within each elementary stream based on importance further includes
14 assigning different priority levels to shape, motion, and texture information.

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16 3. The method as recited in Claim 2, wherein assembling the classified
17 information into packets associated with different classes of network packets
18 further includes selectively multiplexing a plurality of the network packets with
19 the same priority level into an application level packet.

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21 4. The method as recited in Claim 2, wherein assembling the classified
22 information into packets associated with different classes of network packets
23 further includes arranging the content of at least one of the network packets in an
24 interleaving fashion.
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1 5. The method as recited in Claim 1, wherein the different classes of
2 network packets are associated with a network that provides differentiated services
3 (Diff- Serv) such that an adaptive transmission environment is implemented for
4 multimedia communications using scalable coding technology using the
5 differentiation capabilities within at least one network session.

6
7 6. A method comprising:
8 packetizing content information;
9 generating resource coordination information based at least in part on at
10 least one prioritizing parameter associated with an application communicating the
11 content information;
12 selectively associating each packet of content information with a service
13 class selected from among at least two different service classes based on the
14 resource coordination information
15 selectively outputting at least one packet of content information based on a
16 priority associated with the service class associated with the packet of content
17 information; and
18 providing the at least one packet of content information to a network.

19
20 7. The method as recited in Claim 6, wherein generating the resource
21 coordination information further includes generating the resource coordination
22 information based at least in part on at least one prioritizing parameter associated
23 with at least one remote device that is operatively coupled to the network.
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1 8. The method as recited in Claim 6, wherein generating the resource
2 coordination information further includes generating the resource coordination
3 information based at least in part on at least one prioritizing parameter associated
4 with a monitored performance of the network.

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6 9. The method as recited in Claim 6, further comprising encoding
7 initial content information as the encoded content information.

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9 10. The method as recited in Claim 9, further comprising segmenting
10 raw video data into a plurality of video objects and wherein at least one of the
11 video objects is included in the initial content information.

12
13 11. The method as recited in Claim 9, wherein the initial content
14 information includes data representing media information selected a group
15 comprising video information, audio information, image information, and textual
16 information.

17
18 12. A computer-readable media comprising computer instructions for
19 performing acts comprising:

20 generating prioritization information based at least in part on at least one
21 parameter associated with an application streaming media information;

22 associating packets of the media information with a service class selected
23 from a plurality of different service classes based on the prioritization information;
24 and
25

selectively outputting some of the packets of media information based on their respective service class priority levels.

13. The computer-readable media as recited in Claim 12, wherein the media information includes data representing media information selected a group comprising video information, video objects, audio information, image information, and textual information.

14. An apparatus comprising:
logic configured to process content information output by an application layer process and provide resulting processed content information to a network layer process, the logic implementing at least one protocol layer process configured to packetize the content information, a queuing layer process configured to prioritize the packetized content information, and a scheduling layer process configured to selectively provide the prioritized packetized content information to the network layer process based on at least one quality of service parameter.

15. The apparatus as recited in Claim 14, wherein the queuing layer process is configured to provide a plurality of priority class queues arranged to queue the packetized content information.

16. The apparatus as recited in Claim 14, wherein the logic further includes an application-aware quality of service control layer process and a packet mapping layer process configured to operatively provide quality of service

1 differentiation of the content information within a flow of content information
2 from the application layer process.

3
4 17. The apparatus as recited in Claim 14, wherein the protocol layer
5 process operatively includes at least one protocol selected from a group of
6 protocols including TCP, UDP, and IP.

7
8 18. The apparatus as recited in Claim 14, wherein the content
9 information includes data representing media information selected a group
10 comprising video information, audio information, image information, and textual
11 information.

12
13 19. An apparatus comprising:
14 packetizer logic configured to receive encoded content information and
15 output corresponding packets of content information;

16 collaborator logic operatively coupled to the packetizer logic and
17 configured to receive at least one prioritizing parameter associated with at least
18 one application, including an application communicating the content information,
19 and output resource coordination information associated based at least in part on
20 the at least one prioritizing parameter associated with the application;

21 priority mapping logic operatively coupled to the collaborator logic and
22 configured to receive the packetized content information and the resource
23 coordination information, and selectively associate each received packet of content
24 information with a service class selected from among at least two different service
25 classes based on the resource coordination information, and selectively output at

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1 least one packet of content information based on a priority associated with each
2 service class; and

3 forwarder logic operatively coupled to the priority mapping logic and
4 configurable to provide the at least one packet of content information to a network.
5

6 20. The apparatus as recited in Claim 19, wherein the collaborator logic
7 is further configurable to receive at least one prioritizing parameter associated
8 with at least one remote device that is operatively coupled to the network, and
9 output the resource coordination information based at least in part on the at least
10 one prioritizing parameter associated with the remote device.
11

12 21. The apparatus as recited in Claim 19, further comprising:
13 network monitoring logic operatively coupled to the collaborator
14 logic and configurable for use with the network and in monitoring network
15 performance, and to output at least one prioritizing parameter associated with the
16 network performance, and
17

18 wherein the collaborator logic is further configured to receive the at
19 least one prioritizing parameter associated with the network, and output the
20 resource coordination information based at least in part on the at least one
21 prioritizing parameter associated with the network.
22

23 22. The apparatus as recited in Claim 19, further comprising:
24 encoding logic operatively coupled to the packetizer logic and
25 configured to encode initial content information, and output corresponding
encoded content information.

23. The apparatus as recited in Claim 22, further comprising:
segmentation logic operatively coupled to the encoding logic and
configured to segment raw video data into a plurality of video objects, and output
initial content information that includes at least one video object.

24. The apparatus as recited in Claim 22, wherein the initial content
information includes data representing media information selected a group
comprising video information, audio information, image information, and textual
information.

25. A system comprising:
a network environment including a backbone network, and a first
access network and a second access network each being operatively coupled to the
backbone network;

a plurality of host devices including a first host device operatively
coupled to the first access network and a second host device operatively coupled
to the second access network;

a plurality of application-aware resource controllers including a first
application-aware resource controller operatively configured within the first access
network and a second application-aware resource controller operatively configured
within the second access network, wherein the first application-aware resource
controller is configured to selectively aggregate content information associated
with at least one communication session established between the first host device
and the second host device via the network environment, and mapping the

aggregated information to at least one service class selected from a group of two or more different service classes.

26. The system as recited in Claim 25, wherein at least the first application-aware resource controller is configured to selectively adapt a flow rate associated with the content information based on an identified network state.

27. The system as recited in Claim 25, wherein at least the first application-aware resource controller is configured to selectively adapt a flow rate associated with the content information based on at least one identified first device user requirement.

28. The system as recited in Claim 25, wherein at least the first application-aware resource controller is configured to controllably handle the content information per application-based signaling.

29. The system as recited in Claim 25, wherein at least the first application-aware resource controller is configured to operatively associate a priority with the at least one service class.

30. The system as recited in Claim 25, further comprising at least one processing agent operatively configured within the network environment and configured to selectively filter content information associated with different communication sessions based on identified bandwidth constraints and service classes. implement packet-level fast transcoding and related signaling

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2 31. The system as recited in Claim 25, wherein the content information
3 includes data representing media information selected a group comprising video
4 information, audio information, image information, and textual information.

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6 32. The system as recited in Claim 25, wherein the processing agent is
7 further configured to perform packet-level fast transcoding and related signaling.